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REMARKS

The presented claims are 10 – 13 and 19 – 20.

Claims 12 and 13 have been indicated as allowed.

Claims 10, 11, 19 and 20 were rejected under 35 USC 112 for four specified phrases lacking antecedent. The four specified phrases were all in claims 19 and 20, on which claims 10 and 11, respectively, are dependent. Claims 10 and 11 were otherwise indicated as being allowable if the 35 USC 112 rejections are overcome. Applicants have replaced the phrase "the motoring mode" in claim 19 with the amended phrase "a motoring mode." This phrase finds support in the specification, page 8, line 23. The corresponding phrase in claim 20 was actually incorrect; and applicants have thus replaced it with the amended phrase "a generating mode," which finds its support in the specification on page 8, line 24. Applicants have also eliminated the phrase "the quantity Vmag*" from claims 19 and 20 and believe that the 35 USC 112 rejections of the Office Action have thus been overcome.

With claims 10, 11, 19 and 20 being amended to overcome the 35 USC 112 rejections and claims 10 and 11 having been stated by Examiner to be allowable if rewritten as independent claims including the limitations of their base claims and all intervening claims, applicants have rewritten claims 10 and 11 in independent form including all limitations of their base claims 19 and 20. Any language in the final paragraph of claim 10 not included in claim 10 is believed to be inherent in the limitations already in claim 10 and thus redundant; and likewise for claims 20 and 11. Thus, claims 10 and 11 should be in condition for allowance.

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Applicants' claims 19 and 20 apparently stand rejected under 35 USC 102 as being anticipated by US 20020113615 of Atarashi. Applicants traverse this rejection.

Applicants' invention finds utility in the field weakening operation of permanent magnet machines. Applicants' claimed invention provides limiting clamps in each of the independent direct axis and quadrature axis feedback loops of a DC machine control so as to prevent the direct and quadrature voltage command outputs of the independent PI calculators from providing a total commanded voltage greater than a predetermined limit for field weakening operation. Referring to Figure 3 of the described embodiment, for example, the d axis PI controller includes a clamp 80 on its output that prevents the direct voltage command signal (V_{ds}) from exceeding the approximate magnitude of the voltage magnitude command signal (V_{mag}^*). Likewise, the q axis PI controller of Figure 2 provides a clamp 66 on its output that prevents the magnitude of the quadrature voltage command signal (V_{qs}) from exceeding a magnitude approximately equal to the square root of the difference between the square of the voltage magnitude command signal V_{mag}^* and the square of the direct voltage command signal. These limits prevent the direct and quadrature PI control loops from together commanding a voltage that exceeds the limits of the machine in field weakening mode. The word "approximate" is used above for the limits because, in a particular case, it may be desired to adjust the limit values slightly up or down from those determined by V_{mag}^* , depending on the designer's confidence in the robustness of the particular machine. Thus, in one embodiment of the invention, a constant (K), having a value close to (above or below) or equal to one is provided to allow such an adjustment.

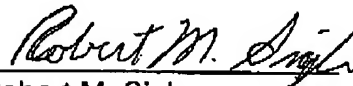
The Atarashi reference shows no such limiting. Paragraph 0091, relied upon by Examiner for the rejection, merely states that the d axis voltage command value $*V_d$ and the q axis voltage command value $*V_q$ are calculated in PI operation or the like. In other words, these values are merely the unlimited

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outputs of PI calculators. They correspond to applicants' recited signals Vds and Vqs; but they are not specifically limited, and particularly not limited in any of the ways that applicants disclose and claim. The disclosure of Atarashi does not deal with field weakening operation and thus does not require the type of limiting that applicants disclose and claim. In fact, Examiner has essentially already recognized this in indicating the allowability of claims 10, 11, 12 and 13 which also recite limits on the direct and quadrature voltage command signals (Vds and Vqs). Thus, Atarashi et al provide no basis for the 35 USC 102(b) rejection of applicants' claims 19 and 20; and applicants assert that their claims, as amended, should be in condition for allowance.

Please charge the cost of any excess independent claims and any other deficiencies, and credit any overpayment, to Deposit Account No. 50-0831.

Respectfully submitted,



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